

- [c1] 1.An imaging apparatus for producing Magnetic Resonance (MR) images of a subject, the apparatus comprising:
 - a magnet assembly for producing a static magnetic field;
 - a gradient coil assembly for generating a magnetic field gradient for use in producing MR images;
 - at least one radiofrequency (rf) coil array disposed about the subject for transmitting a radiofrequency pulse and for detecting a plurality of magnetic resonance (MR) signals induced from the subject for a given imaging sequence; a positioning device for supporting the subject and for translating the subject during imaging; and,
 - a plurality of receivers for receiving the plurality of MR signals, the receivers each being adapted to adjust their respective center frequencies at a rate commensurate with a rate of translation of the positioning device.
- [c2] 2.The apparatus of claim 1 wherein the at least one rf coil array is mounted on a fixture that is disposed about the subject.
- [c3] 3.The apparatus of claim 2 wherein the fixture and rf coil array mounted thereon are stationary relative to the static magnetic field.
- [c4] 4.The apparatus of claim 2 wherein the fixture and rf coil array mounted thereon are moveable relative to the static magnetic field.
- [c5] 5. The apparatus of claim 1 wherein the at least one rf coil array comprises a plurality of coil elements arranged in a orthogonal distribution relative to a frequency encoding direction.
- [c6] 6.The apparatus of claim 1 wherein the at least one rf coil array detects the MR signals concurrently with the translation of the positioning device.
- [c7] 7.The apparatus of claim 1 further comprising:

 an image processor for computing a plurality of respective sub-images

 corresponding to a field-of-view at a plurality of incremented locations of the

 subject and wherein the image processor is further adapted to combine the

 plurality of respective sub-images to form a composite image of the subject.



- [c8] 8.The apparatus of claim 1 wherein the imaging sequence is one of multi-slice, multi-slab, and volume imaging sequences.
- [c9] 9.A method for producing an image from an extended volume of interest within a subject using a Magnetic Resonance Imaging (MRI) system where the extended volume of interest is larger than an imaging portion of a magnet within the MRI system, the method comprising:

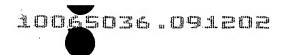
translating the volume using a positioning device along an axis of the MRI system and imaging portions of the volume when they are within the imaging portion of the magnet;

detecting a plurality of MR signals from at least one radiofrequency (RF) coil array for a given field-of-view within the MRI system as the positioning device is translating the volume;

sending the plurality of MR signals to a plurality of receivers, the receivers each being adapted to adjust their respective center frequencies at a rate commensurate with a rate of translation of the positioning device, computing a plurality of respective sub-images corresponding to the plurality MR signals for each of the plurality of receivers and for the given field-of-view (FOV) at a plurality of incremented locations of the subject; and, combining the plurality of respective sub-images to form a composite image of the volume of interest.

- [c10] 10.The method of claim 9 wherein the at least one rf coil array is mounted on a fixture that is disposed about the subject.
- [c11] 11. The method of claim 10 wherein the fixture and rf coil array mounted thereon are stationary relative to the static magnetic field.
- [c12] 12.The method of claim 10 wherein the fixture and rf coil array mounted thereon are moveable relative to the static magnetic field.
- [c13] 13.The method of claim 9 wherein the at least one rf coil array comprises a plurality of coil elements arranged in a orthogonal distribution relative to a frequency encoding direction.
- [c14] 14.The method of claim 9 wherein the detecting step is performed concurrently





with the translating step.

the volume of interest.

- [c15] 15.The method of claim 9 wherein the translating step is repeated until a selected length of the subject has been imaged inside the imaging portion of the magnet.
- [c16] 16.The method of claim 9 wherein the combining step further comprises combining a central portion of each sub-image to form the composite image.
- [c17] 17.The method of claim 9 wherein the extended volume of interest is a head-to-toe view of the subject.
- [c18] 18.A method for imaging an extended volume of interest within a subject using a Magnetic Resonance Imaging (MRI) system comprising: translating the subject into an imaging portion of a magnet assembly of the MRI system; detecting a plurality of MR signals from a radiofrequency (RF) coil array; and, sending the plurality of MR signals to a plurality of receivers, the receivers each being adapted to adjust their respective center frequencies at a rate commensurate with a rate of translation of the positioning device; and, reconstructing at least one image of the volume of interest by computing a plurality of respective sub-images corresponding to the plurality MR signals for each of the plurality of receivers and for the given field-of-view (FOV) at a plurality of incremented locations of the subject as the subject is translated and
- [c19] 19.The method of claim 18 wherein the extended volume of interest is a head-to-toe view of the subject.

combining the plurality of respective sub-images to form a composite image of

- [c20] 20.The method of claim 18 wherein the at least one rf coil array comprises a plurality of coil elements arranged in orthogonal distribution to a frequency encoding direction.
- [c21] 21.The method of claim 18 wherein the at least one rf coil array is mounted on a fixture that is disposed about the subject.

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[c22]	22. The method of claim 21 wherein the fixture and rf coil array mounted thereon are stationary relative to the static magnetic field.
[c23]	23. The method of claim 21 wherein the fixture and rf coil array mounted thereon are moveable relative to the static magnetic field.
[c24]	24. The method of claim 18 wherein the detecting step is performed concurrently with the translating step.
[c25]	25.The method of claim 18 wherein the translating step is repeated until a selected length of the subject has been imaged.
[c26]	26. The method of claim 18 wherein the translating step is substantially continuous.